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AGRICULTURAL ENGINEERING

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ENGINEERING

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WASHINGTON, D. C.

August, 1936.

Accidents.

Safe at home? *Prairie Farmer.* v. 108, no. 12. June 6, 1936. p. 5, 20.
Next to highways, it's the most dangerous place, says Red Cross.

What are the odds against you? *Popular Mechanics.* v. 65, no. 3. March 1936. p. 338-341, 124A. One hundred and one thousand killed, 370,000 permanently injured and 9,821,000 temporarily disabled. Such was the accident toll in 1934 on the highway, in the home and at work. You are safer driving a car at midnight than at seven in the evening. You run less risk driving in crowded traffic than on open highway. There is much more chance of your drowning on a public beach than of being killed in a steamship, rail or airplane accident. And the chances of meeting accidental death in a mine or factory are less than on a farm. Psychologists point out that the weak link in reducing accidents is the human element - the carelessness of the human machine - you. Majority of fatal and non-fatal accidents are not caused by mechanical failures or structural defects of modern inventions and conveniences, but by carelessness.

Agricultural Engineering.

Agricultural engineering marches on. By L.F. Livingston. *Agricultural Engineering.* v. 17, no. 7. July, 1936. p. 277-280.

Looking ahead in Agricultural Engineering. By H.B. Walker. *Agricultural Engineering.* v. 17, no. 7. July, 1936. p. 285-290, 318. So it is with out engineering contributions to agriculture, as it is with any inanimate engineering equipment designed and manufactured to perform specific service; whether or not its service is really helpful to society depends not so much upon originator of equipment, as it does upon attitude and viewpoint of direct beneficiaries. Engineering in itself, whether fortunately or unfortunately, renders and is responsible for service which on whole is measured primarily in terms of direct economic returns, and its contributions are not primarily weapons of destruction or waste.

Science remakes the farm. By L.F. Livingston. *Sugar News.* v. 17, no. 4. April, 1936. p. 149-150. Recent developments of fact - not fancy - indicate that in not-distant future aim of crop regulation will be, not to curtail production, but to increase it to meet growing demands of industry for organic things that grow from soil.

Agriculture.

Good neighbor rural policy. By Graham Claytor. Electrical World. v. 106, no. 25. June 20, 1936. p. 35-36. Aid farmers to understand their economics. Engineering economics need study. Operate and maintain co-operatives without financial responsibility.

\$63 for feeder steers. By F.B. Nichols. Printers' Ink. v. 174, no. 13. March 26, 1936. p. 21, 24-25. Impressive study of agriculture's comeback.

Air Conditioning.

Air conditioning by the sun. By Wilson P. Green. Mechanical Engineering. v. 58, no. 6. June, 1936. p. 369-371. Study of possibility of using solar energy for air conditioning in Florida.

Application factors which govern the selection of refrigerating equipment for air conditioning service. By J.R. Hertzler. Heating, Piping and Air Conditioning. v. 8, no. 7. July, 1936. p. 391-398.

Build to provide summer comfort. By V.L. Sherman. American Builder and Building Age. v. 58, no. 7. July, 1936. p. 72, 74, 76.

Solving the four types of process air conditioning problems. By William Goodman. Heating, Piping and Air Conditioning. v. 8, no. 7. July, 1936. p. 373-377. All air conditioning problems fall into one of four main divisions, depending upon whether sensible and latent heat are being subtracted from, or added to, the space being conditioned. Problems typical of each division are discussed here and solutions by psychrometric chart explained.

Specifications for air conditioning. By E.W. Goodwin. Refrigerating Engineering. v. 32, no. 1. July, 1936. p. 10-14, 56. How Government policy affects contractors. What specification means.

Alcohol Fuel.

Alcohol-gasoline fuel manufacture planned. Oil, Paint & Drug Reporter. v. 129, no. 11. March 16, 1936. p. 23. Sponsored by Farm Chemurgic Council and Chemical Foundation, Inc., which will finance equipping of plant and license operations under its patents. Project is under supervision of Prof. L.M. Christianson, Ames, Iowa. Plant is designed to produce 10,000 gallons of alcohol daily, using No. 3 grade corn. Alcohol will be mixed with ordinary gasoline in ratio of one part of alcohol to nine parts of gasoline. Alcohol will be anhydrous, but otherwise probably will contain impurities not found in ordinary commercial alcohol, but which will not interfere with its fuel properties. Completed fuel will be marketed under the name "Agrolene," and it is claimed that it will have high octane rating, and will be superior motor fuel in all respects. Large orders for new fuel are said to be on file from a number of filling stations and co-operative distributors throughout the farm belt.

Alcohol Fuel. (Cont'd.)

Alcohol motor fuel in U.K. Oil, Paint and Drug Reporter. v. 129, no. 18. May 4, 1936. p. 56.

Chemurgy, as related to the domestic cane sugar industry. By Wm. L. Owen. Sugar Bulletin. v. 14, no. 19. July 1, 1936. p. 5-7. From each ton of cane harvested there would be approximately one fourth of ton of tops with potential yield of 1.7 gals. of alcohol, representing approximately 42.5 cents. In addition there would be extra value of fibre of tops for fuel or for fibre board manufacture.

Gasoline and alcohol-gasoline blends. By L.T. Brown and Leo M. Christensen. Industrial and Engineering Chemistry. v. 28, no. 6. June, 1936. p. 650-652. Comparative studies on influence of air-fuel ratio, engine speed, and throttle opening upon relative power output, specific fuel consumption, and carbon monoxide production.

Associations.

Flood control contractors organize new association. Engineering News-Record. v. 117, no. 5. July 30, 1936. p. 176. National Waterways Contractors Association replaces Mississippi Valley Flood Control Branch of Associated General Contractors of America. It will be Independent organization with unlimited territorial jurisdiction, but will continue to be affiliated with Associated General Contractors of America.

Central Valley Water Project.

California' Friant project. Engineering News-Record. v. 117, no. 3. July 16, 1936. p. 89. Congress having provided money, southern part of great Central Valley project to save San Joaquin Valley will soon be under construction. Friant dam is principal element.

Concrete.

Convenient concrete table for contractors' use. By W.G. North. Engineering News-Record. v. 117, no. 3. July 16, 1936. p. 77-78. Differs from most concrete tables now in general use in that it combines mix, strength and quantities of materials, and differentiates between mix, strength and quantities of materials, and differentiates between gravel and crushed stone aggregates. Table is based upon trial mixtures for various water-cement ratios. Quantities of materials were determined from apparent specific gravity and weight per unit volume of materials available.

Corrosion.

Corrosion of metals by volatile liquid fuels. By L.S. Eaton. Sugar News. v. 17, no. 4. April, 1936. p. 9-10 (Supplement).

Cotton Machinery.

Death knell of cotton pickers suggested at conference. Science News Letter. v. 29, no. 789. May 23, 1936. p. 329, 330.

Men and machines. By Roy Dickinson. Printers' Ink. v. 174, no. 12. March 19, 1936. p. 17, 20-21.

New cotton implements. Farm Implement News. v. 57, no. 16. July 30, 1936. p. 25. Discusses shaver and rake developed by engineers for cutting cotton stalks and collecting surface trash.

Progress in ginning tests and gin testing instruments. By Charles A. Bennett. Cotton Ginners' Journal. v. 7, no. 8. May, 1936. p. 3-4, 17-18.

Who invented the cotton gin? Letter from Joseph W. Roe. Mechanical Engineering. v. 58, no. 6. June, 1936. p. 386-387.

Dairy Farm Equipment.

Cool it quickly ... Keep it cold! Hoard's Dairyman. v. 81, no. 11. June 10, 1936. p. 293. Cooling and clean production methods discussed.

Cooling unit for farm dairy chills milk in can quickly. Popular Mechanics. v. 65, no. 3. March, 1936. p. 405. Made of stainless steel, it can be dropped into any standard size milk can and requires only water pressure from gravity drop of two feet to operate it, cooling can inside and out. Water source, which may be small tank on shelf overhead, is linked to top intake pipe containing regulating valve. There its flow divides into cooling tubes inside milk can, and water motor which turns an agitator to keep milk circulating. Overflow water splashes into high-collared cup at top of can, and drains through perforations in collar, running down outside of can for additional cooling.

Milk utensil sterilizers. By John E. Nicholas. Electricity on the Farm. v. 9, no. 7. July, 1936. p. 7-9.

Dams.

Fort Peck dam today. By H.W. Richardson. Engineering News-Record. v. 117, no. 4. July 23, 1936. p. 105-109. Activities on world's greatest earthfill dam have reached a peak this summer. Hydraulic filling on main dam, driving of diversion tunnels and construction of spillway all are being pushed.

Nine hundred dams inspected. By George W. Hawley. Engineers News-Record. v. 117, no. 3. July 16, 1936. p. 71-76. Six-year California investigation shows one-third of all the dams need repair. Major defects in foundations, inadequate spillways, or in materials or construction.

Dams. (Cont'd)

Parker dam project. By Robert R. Nicholas. Reclamation Era. v. 26, no. 7. July, 1936. p. 168-169.

Drainage.

On the relation between rainfall and stream flow - II. By Richmond T. Zoch. Monthly Weather Review. v. 64, no. 4. April, 1936. p. 105-121. Theory is extended to irregularly-shaped drainage areas such as are actually met with on earth's surface. Throughout article, rate of rainfall, dryness of soil, and velocity of water are considered to be constant. Evaporation is neglected. However, in last section of paper it is pointed out that methods here employed for irregularly-shaped drainage areas are entirely general and can be readily used when aforementioned restrictions are removed.

Plentiful water for irrigation brings drainage problems. Idaho Farmer. v. 54, no. 11. May 28, 1936. p. 3. "Drainage is simply artificial aid to natural underground drainage channels that are too small to take care of extra load supplied by irrigation. Open drains may be dug or land may be drained by means of pumped wells. Open drains usually cost more per acre of land drained than pumped wells. Well drainage has advantage of putting water on surface, where it can be used for irrigation of same land, while open gravity drain can be used only by lower lying lands. Regardless of methods used in organizing for drainage or type of drain to be used, each farmer should watch his ground water and know exactly where it is and how fast it is rising."

Electric Service, Rural

Aerial survey aids electrification project. Electrical World. v. 106, no. 25. June 20, 1936. p. 37.

Rural electrification program. Wisconsin Agriculturist and Farmer. v. 63, no. 12. June 6, 1936. p. 1.

Rural programs are proceeding in full midsummer swing. - Electrical World. News issue. v. 106, no. 28. July 11, 1936. p. 4-5. Total of \$14,664,000 loaned or earmarked by Rural Electrification Administration giving increased impetus to rural electrification programs for current year.

Electricity in the Home.

Effective aid in the war on flies. By T.E. Hinton. Electricity on the Farm. v. 9, no. 7. July, 1936. p. 13-14. Tests of effectiveness of electric fly screen have been conducted at Purdue University agricultural experiment station.

Electricity on the Farm.

Electrified seed corn. By Byron L. Troyer. Electricity on the Farm. v. 9, no. 2. February, 1936. p. 19, 21.

Electricity on the Farm. (Cont'd)

Farm electric milk cooler with pneumatic agitation. By John E. Nicholas. Agricultural Engineering. v. 17, no. 7. July, 1936. p. 281-283. Fig. 1. A cross section view of an electric motor-driven milk cooler with pneumatic agitation. Cooling capacity, six 10-gallon cans each twelve hours. Table 1. Specifications for electric motor-driven milk cooler with pneumatic agitator.

Farm uses of electricity. Pennsylvania Farmer. v. 114, no. 10. May 9, 1936. p. 13, 17.

Influence of ultra short waves on agricultural plants. By J.W. Pincus. Agricultural Engineering. v. 17, no. 7. July, 1936. p. 292. Ukraine Grain Institute and Physico-Technical Institute of Dnepropetrovsk, U.S.S.R. in 1934 started experiments on treatment of cotton, cucumbers, tomatoes, and millet with ultra short waves. They noted quicker maturity and higher yields. In developing this theory, authors state that the ultra short waves and other kinds of radial energy influence by transferring to cells of plants condensed energy. This causes activation of life process. First it acts on energy of germination, and then on hereditary influence of protein hereditary base.

Milk cooler economy. By ByA. Jennings. Electrify on the Farm. v. 9, no. 4. April, 1936. p. 11.

New method of milk pasteurization. By B.E. Getchell. Electricity on the Farm. v. 9, no. 2. February, 1936. p. 11-13. Passage of electric current directly through milk results in uniform generation of heat throughout. This is accomplished by an electric pasteurizer. Electrical pasteurization offers definite and positive solution of problem in that passage of electrical current directly through milk results in production of heat actually within substances of milk itself, and proper mechanical construction insures absolutely uniform generation of heat throughout all portions of milk. Electrical pasteurization does not impair, even in slightest degree, natural milk properties.

Ohio turns on new power. By Walter H. Lloyd. Ohio Farmer. v. 177, no. 12. June 6, 1936. p. 8. Leads nation in rural electrification.

Useful bucket elevator. Electricity on the Farm. v. 8, no. 10. October, 1935. p. 15-16. Small capacity bucket elevator that will lift grain 10 feet may easily be driven by 1/4-horsepower electric motor. It can be made from two 1 x 12-inch boards and two 1 x 6-inch boards, forming a rectangular housing in which four-inch four-ply rubber belt fitted with $3\frac{1}{2}$ x 3-inch galvanized iron elevator buckets is used for elevating feed. Gives construction details and diagram.

Engines.

Modern diesel engine practice. By Orville Adams. New York. Norman W. Henley Publishing Co., 1931. 656 p.

Erosion Control.

Anchoring the good earth. By Charles W. Collier. Sugar News.
v. 17, no. 4. April, 1936. p. 150-151.

Control measures meet challenge of heavy rains. Soil Conservation.
v. 2, no. 1. July, 1936. p. 1, 7, 14.

Demonstrations of erosion control. By H.H. Bennett. Farm Implement
News. v. 57, no. 15. July 16, 1936. p. 29.

Notes on erosion work in far-away Italy. By Albert Chiera. Soil
Conservation. v. 2, no. 1. July, 1936. p. 17-18.

Soil erosion and moisture conservation. By J.G. Haney. Northwest
Farm Equipment Journal. v. 50, no. 7. July, 1936. p. 27-29.

Farm Machinery and Equipment.

Annual cost of farm equipment. Northwest Farm Equipment Journal.
v. 50, no. 7. July, 1936. p. 16. According to surveys made by
Department of Agriculture it is one of smaller items of annual farm
operating costs, running from 3 to 6 per cent of gross annual farm
outlay. At first glance this will sound like a "fairy tale," but
it must be remembered that equipment lasts on the average from 10
to 20 years.

Application of power to farming. By Roger North. Journal of Ministry
of Agriculture. v. 43, no. 3. June, 1936. p. 225-234.

Combine invades the East. New England Homestead. v. 109, no. 12.
June 6, 1936. p. 3. Practical, efficient machine makes its debut
for small farm.

Cultivating equipment. By Charles B. Weeks. Pacific Rural Press.
v. 131, no. 18. May 2, 1936. p. 576.

Cultivation of asparagus. By J.C. Wallace. Journal of the Ministry
of Agriculture. v. 43, no. 3. June, 1936. p. 241-244. Brief
account of establishment of asparagus plantation on the Kirton Agri-
cultural Institute farm, object being to test modification of American
method of single row culture, and to obtain costs of production and
returns.

Farm equipment business is showing rapid recovery. By E.V. Needham.
Implement and Tractor. v. 51, no. 14. July 11, 1936. p. 14-15.
Farm equipment business in 1935 was best since 1930, although it fell
considerable short of results of earlier year. Production amounted
to \$331,998,066, and sales in the United States were valued at
\$300,268,076, according to preliminary official statistics of United
States Bureau of the Census.

Farm machinery and tomorrow's agriculture. By H.F. McColly. Farm
Implement News. v. 57, no. 15. July 16, 1936. p. 28-29.

Farm Machinery and Equipment. (Cont'd)

- Hay chopping grows in favor. By E.T. Leavitt. Farm Implement News. v. 57, no. 13. June 18, 1936. p. 18.
- Haying with power equipment. By E.P. Orcutt. Montana Farmer. v. 23, no. 19. June 1, 1936. p. 3.
- How implement sales rise as farm income gains. Farm Implement News. v. 57, no. 16. July 30, 1936. p. 23. Chart gives gross cash income from farm production and value of farm machinery sales, 1924-25.
- Machinery prices higher in foreign lands than in United States. Wisconsin Agriculturist and Farmer. v. 63, no. 12. June 6, 1936. p. 3.
- More power in the hayfield. By E.T. Leavitt. Utah Farmer. v. 56, no. 20. May 25, 1936. p. 5.
- New "basin" lister worked well in test. Farm Implement News. v. 57, no. 15. July 16, 1936. p. 17. Well adapted to deep, porous soils. Attachment converts furrow into a series of basins which catch and hold rainwater. New method conserves moisture for growing plants, reduces water erosion of soil, lessens danger of washing out of seed or small plants, and to a considerable degree prevents water accumulating in ponds at low points in relatively flat fields.
- Pointers on mower adjustments. By U.S. Bureau of Agricultural Engineering. Farm Implement News. v. 57, no. 13. June 18, 1936. p. 28.
- Pyrethrum harvesting. Agricultural Engineering. v. 17, no. 7. July, 1936. p. 284. Satisfactory machine may be developed for successfully and economically harvesting the crop. Observations and tests made by the Bureau of Plant Industry indicate that pyrethrum plants may be harvested with a binder, dried in shocks, and then threshed to separate flower parts from stalks.
- Robot planter. Market Growers Journal. v. 59, no. 2. July 15, 1936. p. 301. British machine that is now being tried out with view to introduction in this country.
- Self-aligning disk jointer. Agricultural Engineering. v. 17, no. 7. July, 1936. p. 304. Accompanying chart summarizes results of some draft tests made in 1935 with various plow attachments, and shows average draft for self-aligning disk jointers as 14.2 per cent less than for the colters and jointers.
- Silo fillers meet emergency needs imposed by the drouth. Implement and Tractor. v. 51, no. 15. July 25, 1936. p. 14-15, 36. No equipment more completely improved during recent years, it is now more adaptable to individual farm requirements and can be operated at lower costs.
- Straw spreaders prove useful. Oregon Farmer. v. 59, no. 12. June 11, 1936. p. 16. Combine attachment helps check soil erosion.

Farm Machinery and Equipment. (Cont'd)

Taking big crews out of ensilage cutting. By I.P. Blauser. Electricity on the Farm. v. 9, no. 7. July, 1936. p. 10-12.

What alloy steels mean in farm machinery. By C.E. Packer. Implement and Tractor. v. 51, no. 15. July 25, 1936. p. 12-13. 1-Reduction in service costs; 2-Improvement in performance; 3-Longer life at higher speeds.

Fences.

Electric fence. By F.C. Kingsley. Agricultural Engineering. v. 17, no. 6. June, 1936. p. 253-254. Advantages were pointed out to be as follows: 1. Saves time and labor. 2. Saves considerable investment in wire and gates. 3. One wire may be used in place of heavy gate. 4. Less wire required for fencing fields. 5. Keeps livestock from reaching over fence to eat growing crops. 6. Reduces weeds along fence by virtue of livestock eating weeds under wire. 7. Avoids injury to livestock if run through wire fence, as smooth wire may be used instead of barb wire. The disadvantages are as follows: 1. All livestock are not turned away from the fence. This was found true with small pigs. 2. Rainstorms tend to ground the system, although this did not prove to be much of a disadvantage as livestock respect the wire if they have had a shock previously. 3. Electricity may be off for a short time, thus making equipment ineffective.

Fencing with electricity. By E.W. Lehmann. Successful Farming. v. 34, no. 8. August, 1936. p. 22, 32.

Fireplaces.

Landscape architect builds a barbecue. By George J. Carpenter. American Home. v. 15, no. 6. May, 1936. p. 105-108.

Fires.

Farm fire precautions. By M.L. Wilson. Southern Agriculturist. v. 66, no. 6. June, 1936. p. 11, 18.

Floods and Flood Control.

Coordinating flood control work. Engineering News-Record. v. 117, no. 7. July 23, 1936. p. 136. Intention of Water Resources Committee is to develop methods by which flood control activity may go ahead while collateral objectives of other agencies of government in emergency flood control areas, such as conservation, reforestation, etc., proceed as expeditiously as possible.

Dr. Bennett talks on flood control. Soil Conservation. v. 2, no. 1. July, 1936. p. 2-6.

Floods and Flood Control. (Cont'd)

Flood control policy. Letter from Joseph Jacobs. Engineering News-Record. v. 117, no. 4. July 23, 1936. p. 131. Although formulation of definite, federal flood control policy should await results of more extensive flood control surveys and investigations than have yet been made, there is one basic principle that should certainly be included and, as far as practicable, it should also obtain for any interim legislation for specific projects. That principle is that payment for flood control developments should be regarded as specific responsibility of local, state and federal interests, and that cost allocation to these three agencies should be on basis of benefits conferred.

Miniature river may solve flood control. Wyoming Stockman-Farmer. v. 42, no. 6. June, 1936. p. 1.

Fuels.

Flue gas weights calculated from fuel analyses. By J.R. Darnell. Power Plant Engineering. v. 40, no. 7. July, 1936. p. 394-397. By means of analyses of coals, oil and gases with the aid of tables, charts and formulas, the weights of flue gases to be handled can readily be calculated for various rates of combustion.

Fuel consumption problem. By Alex Taub. S.A.E. Journal. v. 38, no. 2. February, 1936. p. 66-69. Fuel consumption prevailing today is no better than it was five years ago. Higher road speeds are responsible. Cars in the hands of owners today are below potential economy between 10 and 15 per cent. Minor adjustments can correct this.

Relation of exhaust gas composition to air-fuel ratio. By B.A. D'Allewa and W.G. Lovell. S.A.E. Journal. v. 38, no. 3. March, 1936. p. 90-98. In work reported in this paper, complete exhaust gas analyses for carbon dioxide, carbon monoxide, hydrogen, methane, and oxygen have been related to directly measured air-fuel ratios for three engines over range of operating conditions and with varied air-measuring equipment. Data are consistent and show that exhaust gas composition is related to measured and also to computed air-fuel ratios with deviation of about 3 per cent. Rapid determination of one or more constituents in exhaust gas, or measurement of some physical property, thus serves to estimate air-fuel ration rapidly and accurately. Results of such measurements are accordingly useful in investigation of variety of carburation and fuel problems, and in rapid estimation of volumetric efficiency.

Hay Drying.

Now ways with hay. By E.T. Leavitt. Pennsylvania Farmer. v. 114, no. 10. May 9, 1936. p. 24-25.

Houses.

Planning methods for small dwellings. American Builder and Building Age. v. 58, no. 7. July, 1936. p. 60-64, 104, 108. Summary of the recommendations in FHA technical bulletin no. 4 on planning of small, low cost houses.

Houses. (Cont'd)

Small farm house designed for Middle West. Wisconsin Agriculturist and Farmer. v. 63, no. 13. June 20, 1936. p. 12.

Houses-Repairing.

First aid for the ailing house. By Roger B. Whitman. New York. Whittlesey House, 1934. 320 p.

Hydraulics.

Textbook on hydraulics. By George E. Russell. New York. Henry Holt and Company, 1934. 447 p.

Insulation.

Good heat insulation saves money. By B. A. Jennings. Electricity on the Farm. v. 9, no. 7. July, 1936. p. 15, 18.

Irrigation.

Effect of irrigation upon soil texture. Science. v. 84, no. 2167. July 10, 1936. p. 39-40. Effect of irrigation upon soil texture has been noted in Salt River Valley, Arizona.

Irrigate alfalfa early. California Cultivator. v. 83, no. 4. February 15, 1936. p. 141.

River problems in lead at Portland Convention. Engineering News Record. v. 117, no. 4. July 23, 1936. p. 124-127. Power plants and irrigation problems engage main interest of large gathering of American Society of Civil Engineers' western members.

Russia builds large plants to water Armenian deserts scheduled to cost millions. Reclamation Era. v. 26, no. 7. July, 1936. p. 167. Project provides for construction of eight power stations along Zanza River, and for creation of a huge artificial lake by damming a volcanic valley at an altitude of 4,275 feet, which is in dominant position above Great Sardanabad Desert. This lake, with estimated capacity of 5,000,000,000 cubic feet will be fed by diversion canal from Zanza River.

Sled train sprinkler is market garden aid. Agricultural Engineering. v. 17, no. 7. July, 1936. p. 298. Especially adapted to long narrow fields in humid regions, and does not seriously interfere with cultivation. Wooden sleds about 8 inches high are spaced 15 feet apart for length of pipe, and carry it the length of field. They are connected with two No. 9 galvanized steel wires passed along length of train and fastened to sides of each sled. At each end of train, ends of two long wires are brought together and looped through ring of single tree and held in place by wooden block. 200-foot pipe, with holes drilled about 3 feet apart and equipped with nozzles, is laid on tops of sleds, and is held in place with nails or wooden blocks.

Irrigation. (Cont'd)

Thousands of gallons of rain, where you need it when you need it.
By Tudor Charles. Kansas Farmer. v. 74, no. 13. June 20,
1936. p. 3, 16.

What more water means to you! By N. R. McCreery. Through the
Leaves. v. 24, no. 4. July, 1936. p. 110-112. Transmountain
diversion of water offers biggest opportunity northern Colorado has
had since beginning of irrigation development of this territory.

Land Utilization.

Planning the land for the future. By L. Dudley Stamp. Science.
v. 80, no. 2084. December 7, 1934. p. 507-512.

Sound land utilization program. California Cultivator. v. 83, no. 4.
February 15, 1936. p. 140. Various means of promoting better
land use, other than through public acquisition, are being studied
by land use planning section of resettlement administration. Revised
taxation systems to encourage conservation, development of county
zoning programs, and prosecution of sound, vigorous policies in regard
to tax-delinquent land are among matters of policy which are now
being investigated.

Lubrication.

Electric refrigeration and air conditioning. Lubrication. v. 22,
no. 6. June, 1936. p. 61-72.

Operator's woes on lubrication. B. F. L. Faulkner. S.A.E. Journal.
v. 38, no. 4. April, 1936. p. 133-147.

Miscellaneous.

Classification and compensation of Federal engineering positions. By
John C. Hoyt. Civil Engineering. v. 6, no. 3. March, 1936.
p. 194-197. Explains allocation of positions in terms of class,
service, occupational group, grade and series. In particular describes
application of these methods to engineering positions, giving limit-
ing salaries for various grades and classifications

Droughts of 1930-34. By John C. Hoyt. Washington, D.C. 1936. 106 p.
U.S. Geological Survey. Water Supply paper 680.

Increase in farm population. Farm Implement News. v. 57, no. 16.
July 30, 1936. p. 26. Over one and third million more persons were
living on farms in United States on January 1, 1935, than on April
1, 1930, according to a U.S. Summary of 1935 Federal Farm Census.

Miscellaneous. (Cont'd)

Let's go partners. By Karl T. Compton. Country Home. v. 60, no. 6. June, 1936. p. 11-13. Real basis for lack of economic balance between agriculture and industry is that American industry has far outdistanced agriculture in science, is magnificently organized on selling side, is flooding whole world including farm with stream of new things and services we all want.

Security and permanence for the farm home. By K.L. Hatch and R.A. Amundson. Madison, Wis., 1936. 48 p. Wisconsin. College of Agriculture. Extension Service. Circular 279.

Plows and Plowing.

Engineers list points in plow selection. Wisconsin Agriculturist and Farmer. v. 63, no. 11. May 23, 1936. p. 10. Six points are: Rugged and rigid construction; Ample clearance for passage of trash and for accommodation of attachments; Plow bottoms of proper size and suited to soil, to speed of plowing and to power available; Large colters, and moldboard jointers if available; Provision for ample and easy adjustment of hitch and attachments; Pressure lubrication for all moving parts.

Plumbing.

Straight is the way to good plumbing. By Harry C. Richardson. Country Home. v. 60, no. 7. July, 1936. p. 46-47.

Poultry Houses and Equipment.

Summer range shelter. By P.B. Zumbro and H.P. Twitchell. Ohio Farmer. v. 177, no. 12. June 6, 1936. p. 24-25. Plans and bill of material for building.

Pressure Measurements.

Representing the distribution of ground stresses. By Ing. K. Fischer. A.S.T.M. Bulletin. No. 81. July 31, 1936. p. 12-13. Brief description of new methods.

Pumps and Pumping.

Electricity for farm and home. By L.J. Smith. Oregon Farmer. v. 59, no. 13. June 25, 1936. p. 13. Discussion of pumps.

Reclamation.

Aspects of land reclamation in Italy. By Augusto Alfani. Agricultural Engineering. v. 17, no. 7. July, 1936. p. 296, 320.

Refrigeration.

Analysis of absorption systems. By A.B. Stickney. Ice and Refrigeration. v. 91, no. 2. August, 1936. p. 93-95. Properties of ammonia-water solutions as related to absorption systems - Combinations of auxiliary apparatus - Derivation of complete heat-balance as guide to method of analysis - Analysis and advantages of compound cycle.

Carbon dioxide in its new field of usefulness. By J.C. Goosmann. Ice and Refrigeration. v. 91, no. 2. August, 1936. p. 137-142. Developments in production of carbon dioxide - Comparison of carbon Dioxide multiple effect indicator diagram with pressure-enthalpy - Determination of correct multiple effect pressures - Typical dual effect carbon dioxide refrigerating diagram - Combination of expansion and compression cylinder - Origin of fin type coolers.

Development of "Freon - 12" refrigerating machinery. By L.S. Morse. Refrigerating Engineering. v. 32, no. 1. July, 1936. p. 17-20, 64.

New standards for commercial refrigerating units. By Glenn Muffly. Power Plant Engineering. v. 40, no. 7. July, 1936. p. 393. Introduction of small commercial condensing units in refrigerating field justify new standard for rating and testing.

Research.

Chemical research, its value and influence upon recovery. By A.G. Overton. Science. v. 84, no. 2168. July 17, 1936. p. 49-54.

Chemistry in service of science. By A.T. Lincoln. Science. v. 80, no. 2082. November 23, 1934. p. 463-470. Farm products as potential raw materials for the chemical industry.

Research reported to the A.S.T.M. Convention. Engineering News Record. v. 117, no. 3. July 16, 1936. p. 82-84. Studies in cement and concrete, steel, iron and bituminous materials provide new data for specifier and manufacturer.

Septic Tanks.

Septic tank is easy to make. By Walter Andrews. Idaho Farmer. v. 54, no. 9. April 30, 1936. p. 253. Gives diagram.

Sewage and Sewage Disposal.

Sewage disposal. American Architect. v. 147, no. 2639. November, 1935. p. 76-87. 1. General design. 2. Septic and siphon tanks. 3. Distribution boxes, etc. 4. Leaching cesspools. 5. Subsoil and disposal beds. 6. Sand filters.

Soil Mechanics.

Soil mechanics formally accredited. Engineering News-Record. v. 117, no. 1. July 2, 1936. p. 21-23. Five days conference of 200 delegates from a score of nations brings forth exceptional volume of recorded data and analysis of soil action, and definitely puts new science among major resources of modern engineering.

Soil mechanics notes - 1. Engineering News-Record. v. 117, no. 4. July 23, 1936. p. 114-117. Brief summaries of important practical information extracted from selected papers presented at International Conference on Soil Mechanics and Foundation Engineering.

Sprays and Spraying Equipment.

Improved spraying equipment. Farm Implement News. v. 57, no. 13. June 18, 1936. p. 30. More powerful engine, designed for faster speed, together with new and superior design of pump have almost doubled pressure available at nozzle. Weight has been decreased through use of better materials which also give longer life and less cost for replacement parts.

Storage.

How long do vegetables store? Market Growers Journal. v. 58, no. 12. June 15, 1936. p. 276. Gives table of storage requirements of some common vegetables.

Tires.

Ground-gripping tractor tires solve farm problems. Popular Mechanics. v. 65, no. 3. March, 1936. p. 406-407. Tread is made of extra tough rubber, designed with deep grooves between scientifically placed crossbars. These ribs are oppositely inclined on two sides of tread, ribs on one side passing beyond center of tread to join up with oppositely inclined ribs on other side; continuous grip on ground is thereby provided. Open grooves extending from sides of tire beyond center of tread provide self-cleaning. Tread is so effective that chains are said to be unnecessary under any conditions.

Rubber-tired combines tested by Washington State engineers. Implement Record. v. 33, no. 7. July, 1936. p. 42. Pulled from 14 to 23 per cent easier than machines equipped with steel wheels. Demonstration featured comparison of draft of a 16-foot Harris combine harvester first equipped with low-pressure tires and then changed over to original steel wheel equipment. Harvester was drawn by Model K Allis-Chalmers crawler tractor over silt loam soil seeded to spring wheat, and draft was checked on drawbar dynamometer furnished by agricultural engineering department of state college. In drawing machine up 20 per cent slope, rubber equipment showed 23.6 per cent decrease in draft from that required for steel wheels. In drawing same machine along contour of 50 per cent slope rubber tires reduced draft 14.3 per cent.

Tires. (Cont'd)

Rubber-tired tractors. Montana Farmer. v. 23, no. 19. June 1, 1936. p. 6. Views on cushioned power.

Tractors.

Record of a nine year old tractor. Market Growers Journal. v. 58, no. 12. June 15, 1936. p. 275. Cost of operating Farmall tractor QC-593. Summary of costs for nine years of actual operation.

Tractor depreciation tables, suggested by big Eastern farmer. By D. G. Williams. Implement Record. v. 33, no. 7. July, 1936. p. 13.

Trailers.

Home comforts in this family trailer. Popular Mechanics. v. 65, no. 2. April, 1936. p. 604-608.

Home made trailer for the farm. By L. G. Schwantes. Hoard's Dairyman. v. 81, no. 12. June 25, 1936. p. 322.

Your family trailer. Part 2. Popular Mechanics. v. 65, no. 3. March, 1936. p. 445-449.

Ventilation.

Attic ventilation sells. By W.G. Moore. Electrical World. v. 106, no. 23. June 6, 1936. p. 86-87. Home cooling can be done well by attic ventilation. Methods to use and results cited.

Waste Disposal.

Disposal of wastes from milk products plants. By E. F. Eldridge. East Lansing. Mich., 1936. 18p. Michigan Agricultural Experiment Station. Special bulletin no. 272.

Water Conservation.

Conservation of water, - progress report of the Committee of the Irrigation Division: Discussion. By W.P. Rowe and A.A. Young. Proceedings of American Society of Civil Engineers. v. 62, no. 5. May, 1936. p. 798-807.

Water conservation in eastern Montana. By O.W. Monson. Montana Farmer. v. 23, no. 21. July 1, 1936. p. 3, 27.

Water conservation projects on Red River of the North. Engineering News-Record. v. 117, no. 5. July 30, 1936. p. 179. State planning boards of Minnesota, North Dakota, and South Dakota, in cooperation with National Resources Committee, have developed group of projects designed to conserve water in basin of Red River of the

Water Conservation. (Cont'd)

North. Proposed work includes construction of small dams, restoration of natural lake levels, channel improvements, flood control, reduction of stream pollution, and improvement of municipal and rural water supplies. Cost of work would be about \$10,000,000.

Water Heating.

How to reduce radiation losses on hot water jobs by careful design and installations. By A.F. Craver. Domestic Engineering. v. 147, no. 6. June, 1936. p. 82-84.

Study of electric water heaters. By Evelyn H. Roberts. Agricultural Engineering. v. 17, no. 6. June, 1936. p. 244-246. 1936 electric water heater has been developed to meet several present demands and situations. (1) higher wattages to speed up water-heating process; (2) clock control, to lower household demand for power during peak periods; (3) special meters, to create revenue based on actual usage; (4) lower thermostat settings; and (5) use of two thermostats on larger tanks to keep operating costs within reasonable range, and to eliminate hazards due to excessive water temperatures.

Water for poultry in cold weather. By T.E. Hinton. Electricity on the Farm. v. 8, no. 11. November, 1935. p. 7-8, 19.

Water Power.

Utilization of developed water power in Canada. The Bulletin, Hydro-Electric Power Commission of Ontario. v. 23, no. 5. May, 1936. p. 180-184. Discusses briefly total figures available and developed power, current progress in development, utilization of developed power, past and future growth in development, capital invested in water power development and coal equivalent of developed water power.

Water Proofing.

Waterproofing. Architectural Forum. v. 63, no. 6. December, 1935. p. 539-541.

Water Resources Committee.

Activities and aims of the Water Resources Committee. Engineering News-Record. v. 117, no. 22. July 9, 1936. p. 42-43. In pursuing its major objective of coordinating operations of central and local agencies concerned with water resources development, the committee is concerning itself with basic hydrologic data, balanced river regulations, stream pollution, drainage and water storage.

Water-resource study begun on nation-wide scale. Engineering News-Record. v. 116, no. 21. May 21, 1936. p. 726-727. Detail survey of utilization and planning of water resources in country's major drainage basins is being carried out in cooperation with state and regional planning boards. Undertaken by Water Resources Committee of National Resources Board.

Water Rights.

Study of the preferential rights in use of water and their relation to agriculture and of authority for enforcement. By G.E.P. Smith. 1936. 9 p. Mimeographed. Reprinted from the Proceedings of the fifth annual conference, Institute of irrigation agriculture, American Farm Bureau Federation. March 11, 12, 13, 1936. Salt Lake City, Utah.

Water Supply.

Lakes in rural communities. By L.C. Tschudy. Agricultural Engineering. v. 17, no. 5. May, 1936. p. 209-211. Paper deals with water and soil conservation policies and problems in northern portion of Great Plains states.

Supplying southern California's water needs. By Jack Klein. California Cultivator. v. 83, no. 11. May 28, 1936. p. 387, 415.

Water supplies in drought areas found not to be seriously affected. Engineering News-Record. v. 117, no. 3. July 16, 1936. p. 99-100. District engineers of the U.S. Geological Survey report on water supply conditions throughout the drought area. Few supplies have failed, and others are adequate unless drought is of long duration. Most deficiencies are in towns having surface supplies.

Water Supply, Rural

Running water on the farm. Northwest Farmer. v. 5, no. 3. July, 1936. p. 4.

Watersheds.

Outline of project for a comprehensive study of the Mohawk watershed. By E.S. Cullings. Albany, N.Y., Division of State Planning, 1936. 21 p. Mimeographed. N.Y. Division of State Planning. Bulletin no. 22. Project is the formulation of a unified program for the development and utilization of the land and water resources of the Mohawk drainage area.

Woods.

Some chemical methods of wood destruction. By H.C. Long and R.K. MacDowall. 1935. 24 p. Contains section on machinery for distribution of materials. Reprinted from the Journal of the Royal Agricultural Society of England. v. 96, 1935.

Woods in irrigation ditches. By Walter S. Ball. Pacific Rural Press. v. 131, no. 11. March 14, 1936. p. 340-341.

Wells.

Effective diameter of well network. By Willard Gardner and T.R. Collier. Agricultural Engineering. v. 17, no. 6. June, 1936. p. 240. Attempt is made here to extend analysis to case of network of more general character.

Farm wells. By A.G. Tyler. Northwest Farmer. v. 5, no. 3. July, 1936. p. 15, 18.

Some facts about farm wells. By A.G. Tyler. Implement and Tractor. v. 51, no. 15. July 25, 1936. p. 19, 37.

Well battery design. By Willard Gardner and Alton H. Peterson. Agricultural Engineering. v. 17, no. 7. July, 1936. p. 293-295. Studies have been made in physics department at Utah Agricultural Experiment Station which seem to indicate that a number of small wells connected to common center will decrease loss of energy due to friction in water-bearing gravel, and thereby increase efficiency in use of power for pumping.

Whitewashing.

Whitewash for farm uses. Michigan Farmer. v. 186, no. 9. April 25, 1936. p. 11.

Whitewash on the farm. Hoard's Dairyman. v. 81, no. 6. March 25, 1936. p. 159.

Wind Breaks.

Ten pointers on tree windbreaks. 1936. 4p. Purdue University. Department of Agriculture Extension. Leaflet no. 189.

Tree windbreaks for Missouri farms. R.H. Westwold. 1936. 7 p. Missouri. College of Agriculture. Agricultural Extension Service. Circular no. 343.

Windmills.

My neighbor says his windmill is thrifty. By E.T. Leavitt. Farm Implement News. v. 57, no. 12. June 4, 1936. p. 24-25.

Our thrifty windmill. By E.T. Leavitt. Farm and Ranch. v. 55, no. 10. May 15, 1936. p. 18. Uses free power, which otherwise would go to waste, to do one of the most important jobs on our farm. Recent improvements permit pumping in lighter winds, which makes them useful more days in year and also increase their output of water.

Power from the wind. Western Farm Life. v. 38, no. 9. May 1, 1936. p. 12. Electric plants charged by propellers bring light and service to farm homes.

Windmills. (Cont'd)

- Production and sales of windmills. Farm Implement News. v. 57, no. 12. June 4, 1936. p. 25.
- Thrift in use of windmills. By E.T. Leavitt. Implement & Tractor. v. 51, no. 11. May 30, 1936. p. 11.
- Wind charger runs radio, lights. Farmer-Stockman. v. 49, no. 10. May 15, 1936. p. 24.
- Wind does the generating? Hoard's Dairyman. v. 81, no. 7. April 10, 1936. p. 184-185.
- The wind works for me. By Fred Hawthorn. Farm Journal. v. 60, no. 6. June, 1936. p. 13, 29.

Wood Preservation.

- Creosote distribution in treated wood. By Stanley J. Buckman. Industrial and Engineering Chemistry. v. 28, no. 4. April, 1936. p. 474-480. Investigation was made of creosote distribution throughout sapwood of freshly creosoted southern yellow pine poles. Comparative amounts of creosote per unit volume in spring and summerwood of majority of annual rings were found to be opposite from that commonly believed, springwood having higher concentration of creosote. Observed creosote distribution between two portions of annual rings seemed to be result of interaction of two factors - namely, difference in amount of space available for creosote absorption and probable difference in case of concentration. Results showed there was an appreciable difference in amount of air space in two treated portions of annual rings. This supports view that distribution and relative amounts of spring- and summerwood in sapwood of creosoted poles are factors influencing bleeding of these poles.
- Termite control. Architectural Forum. v. 63, no. 6. p. 542-543. December, 1935.

World Power Conference.

- First world power exhibit to open. Electrical World. v. 106, no. 26. June 27, 1936. p. 8. Replete with every device from electric hay hoist to ultra-violet ray lamps for chickens, a completely electrified farm will be opened near Washington on July 1 as first exhibit of Third World Power Conference. Farm has been equipped through cooperation of Rural Electrification Administration, National Electrical Manufacturers Association and other private firms. Power will be furnished by Virginia Public Service Company.
- World power conference to call leading technical economists. Electrical World. (News issue). v. 106, no. 24. June 13, 1936. p. 6. Conference to stress economic rather than technical phases of power. Outstanding American authorities to lead conference discussions. Gives program - September 7-12.